

Subject Index

(Page numbers followed by *n* indicate reference notes; those followed by *t* indicate tables; those in italics indicate material in discussion.)

- A**cademy of Health Sciences, 134
Acheson, Dean, 58
Accountability, 104, 105, *See also* Ethical issues; Responsibility
Ad Hoc Group of Governmental Experts, 125–126
Ad Hoc Group on Biomedical Research, 200
Aedes albopictus, 149–150
AIDS, 117–118, 150
 international programs, 151, 167, 169, 170
Akimoto Sueo, 36
Allegations of biological warfare, *See* Biological warfare allegations
Allergan, 221
American Association for the Advancement of Science (AAAS), 235–236, 239
American Association of Medical Colleges, 235
American Chemical Society (ACS), 236
American Institute of Biological Scientists, 193, 235
Amherst, Jeffrey, 11–12
American Society for Microbiology (ASM), xiii, 191, 193, 230–239
 Advisory Committee, 231, 232
Archives, 234
Code of Ethics, 194, 233
Committee on Ethical Practices, 237
Public and Scientific Affairs Board, 194, 200, 230, 233–235
resolution on biological warfare, 232, 233
War Committee on Bacteriology, 231
Anda, 32
Anthrax, 82, 151, 196, *See also* *Bacillus anthracis*
 in Sverdlovsk, 15–16, 72, 118, 129, 142, 169, 193
toxins, 133
use during WWII, 13, 23, 29, 32, 33
vaccine, 116, 197, 222, 227
- Antibiotic resistance, 150, 191
Antiviral compounds, 208
Arboviruses, 209
Arenaviridae, 148*t*
Argentine hemorrhagic fever, 148*t*, 212
Armed Forces Epidemiological Board, 189
Armed Forced Medical Intelligence Center, 134
Army Biological Laboratories Advisory Committee, 193
Army Chemical Corps, 231, *See also* Chemical Warfare Service
Army Medical Research and Development Command (AMRDC), 165
Army Science Board, 189
Arthropod vectors, 57, 148*t*, 206, 208, 214
Article I, *See* BWC Article I
Article V, *See* BWC Article V
Article X, *See* BWC Article X
- B***Bacillus anthracis*, ix, 79*n*, 183, *See also* Anthrax
Bacillus globigii, 14
Bacon, Francis, 91
Bacterium tularensis (*tularemia*), 79*n*
Baldwin, Ira L., 192
Banting, Frederick, 192
Baylor University, 221
Bayne-Jones, Stanhope, 191
Bee feces, 73, 130, 188
Beiyinhe, 24–25
Bernstein, B.J., 177, 185*n*
Best, Charles, 192
Biofocus Foundation, 6–7
Biological arms control, 1–8
Biological defense and industry, 219–229
Biological Defense Research Program, 131–145, 179–180, 195, 204, 235
 and ethics, 100–103, 110
intent, xi, 115–116

- Biological Hazards Early Warning Program (BHP), 146–176
funding, 163–165
legal basis, 156–158
operation, 158–163
purpose, 146
- Biological Threat Analysis Center, 165
- Biological threats of natural origin, 147–151
- Biological warfare
agents, xi, 114, 132, 160t, 181
attraction for poor nations, 2, 17, 21, 171
Cold War concern over, 40–41
history, 9–20
- Biological warfare allegations, 53–54, 73
during WWI, 13
in Korean War, 54–58, 62, 231
in Laos, 72–73, 118–119, 142
investigation, 56, 62, 168
- Biological Warfare Committee (WBC), 191
- Biological warfare delivery systems, *See* Delivery systems
- Biological warfare policy, 15, 43, 63–70, 179
ASM role in, 230, 233
under Nixon, xii, 178, 195
- Biological warfare research (BWR), xii, 181
civilian control, 191–201
from 1940 to 1969, 14–15, 177–178
intent, 101–104, 133, 134
justification, 36–38, 95–97, 232
Biological warfare research in Japan, See Japanese WWII biological warfare research
- Biological weapon systems, 151, 152
- Biological weapons
characteristics, 184–185
purposes, 135–138
- Biological Weapons Anti-Terrorism Act, 234
- Biological Weapons Convention (BWC), xii, 7–8, 15, 43, 111–112, 220
See also BWC review conferences
and BDRP, 134
and "whistle-blower's fund," 233–234
Article I, 114, 131, 134–140, 179
Article V, 118, 122, 126
Article X, 126, 164
implementation, 5, 140, 155–157
provisions, 121, 179
- Article XV, 136
funding, 164
description, xi, 131
- intent, 153
illegal activities under, 115t
prohibitions, 131, 134, 135, 138, 139, 181
relevance to research, 113–130
U.S. compliance, 15, 178–180, 195
verification problems, 3, 116–119, 154–155, 193
verification protocol, 115t, 118–120, 124, 125, 140–141
violations alleged, 72, 118–119
weaknesses, 114–116, 118, 119, 155
- Biological weapons research, *See* Biological warfare research
- Biotechnological advances, *See* Modern biotechnological advances
- Blepharospasm, 221, 227
- Board of Public Affairs of the ASM, 194, 200
- Bolivian hemorrhagic fever, 148t, 221–222
- Botulinum toxin, 79n, 183, 221
- Botulinum vaccine, 226
- Bouquet, Henry, 11–12
- Boycott of biological warfare research, 43
- Boyle, Francis A., 132
- Boyle, Robert, 92
- Bradley, Omar N., 64
- Brandt, Karl, 93, 97
- Browne, Thomas, 91–92, 98n
- Brucella suis*, 68, 82
- Bunyaviridae, 148t
- Bush, George, 43, 234
- BWC review conferences, 15–16, 113, 117, 195
- RC1 [First Review Conference], 16, 117, 118
- RC2 [Second Review Conference]
confidence-building measures, 119–127, 155, 169, 180, 185
contact among researchers, 154, 179, 184
data exchange, 120, 123, 140, 154, 179, 184, 195
- Final Declaration, 114, 120, 122, 179
- publication of research, 121, 154, 179, 184
- RC3 [Third Review Conference], 120, 122–127, 154–158
- RC4 [Fourth Review Conference], 125

Camp Detrick, 14, 177, 192, *See also* Fort Detrick
Cancer, 221
Capillariasis, 167

- Cataracts, 221
Cell-state theory (*Zellenstaat* theory), 93, 96
Celsus, 91, 98n
Center for Infectious Diseases (CID), 196, 197
Center for the History of Microbiology, 234
Centers for Disease Control, 165, 196, 203, 206, 218
Central Intelligence Agency, 131
Centre for Applied Microbiology and Research (CAMR), 219, 221, 226
Changchun, 27–28, 33
Chemical Warfare Service, 63, 177, 191
Chemical Weapons Convention, 127n
Chikungunya virus vaccine, 212
Chinese People's Commission for Investigating the Germ Warfare Crime of American Imperialists, 56
Cholera, 151, 167, 168
in WWII Japanese BWR, 25, 30, 33, 34
Chou En-Lai, 55, 56
Civilian oversight, xii, 110, 168, 191, 195–199
Clendenin, R.M., 177, 186n
Cloning, 187, 192, 214, 215
Cole, Leonard A., 43
Colls, J.R., 192
Commission of the International Association of Democratic Lawyers, 56
Committee for Responsible Genetics, 100, 101
Committee on Biological Warfare, 63
Committee on Information Concerning Civil Defense Against Biological Warfare, 231
Committee on the Military Use of Biological Research, 220
Compositions Medicamentorum (Scribonius Largus), 91, 98n
Compton, Karl T., 63
Conference on Bacteriological Warfare, 232
Conspiracy of Pontiac and the Indian War After the Conquest of Canada, The (Parkman, F.), 11, 18n
Council for Responsible Genetics, 116
Coxiella burnetii (Q fever), 79n, 183
- D**alrymple, Joel M., ix–x
Davies, Thomas D. 136
De Medicina (Celsus), 91, 98n
- Defense Science Board, 189
Defensive biological research, xi–xii, 95, 96, 181
Defensive purposes, 136–137
Delivery systems, 133, 151, 152
ineffectiveness of, 68, 103–104
pre-WWI, 10–12
prohibited, 137–138
used by WWII Japanese BWR, 28, 32–34
Dengue, 133, 148t, 149, 212
and NMRU, 167
type 4, 214
vector, 149
Department of Commerce, 228, 235
Department of Defense (DoD), 139, 197
field testing, 209
funding, xiii, 198, 199, 210
human experiments, 209
investigators, 202–218
open research, 203, 216
research programs, 131–134, 202–218
secrecy, 141
“threat list”, 180, 197, 203–204, 208
Desert Storm, 1, 104, 171, 191, 235
Detection, 151–153, 191, 222
Deterrence, 96, 132, 134–136, 177, 215
Diagnostic technology development, 205
Disease outbreaks, 169, 203, 206
investigation, 146, 203–204
reporting, 120, 125, 154, 158
Diseases used in Japanese WWII BWR, 30, *See also* Japanese WWII BWR
Draft Programmatic Environmental Impact Statement (DEIS), 132
Dugway Proving Grounds, 16
Dysport, 221, 227
Dystonias, 221
- E**bola fever, 205
Eighteen Nation Disarmament Committee, 119
ELISA diagnostics, 168
Emerging viruses, 147, 148t
Enhanced Proliferation Control Act, 3
Environment Impact Statement (EIS), 195
Epidemiological Intelligence Service, 165
Epidemiological surveillance, 158
Equine encephalomyelitis, 133
Erythropoietin, 163
Essay Concerning Human Understanding, An (Locke), 92

- Ethical issues, xiii, 6, 95, 180, *See also* Accountability, Responsibility of biological defense research, 100–111, 220–222
 of biological warfare, xv, 84–87
 of human experimentation, 22
 role of scientific societies in, 230, 236–237, 239
 Ethical utilitarianism, 86
 Ethics, 85
 and WWI Japanese BWR, 35–40
 ASM code, 194, 233
 life-sciences liberalism, 94–95
 of secrecy, 97
 standards, 97
 traditions, 90–93, 96
 Eugenics movement, 93, 97
 Exchange of data, 120, 123, 233, *See also* BWC RC2
 Export control, 191, 223, 224, 228, 229, 235
- F**DA, 190, 209
 Feces, *bee*, 73, 130, 188
 Federation of American Scientists (FAS), 122, 124, 128n, 141, 236
 Federation of American Societies for Experimental Biology, 235
 Field testing, 152
 Canadian, 14
 Japanese, 32–35
 recommended by Stevenson Committee, 65
 U.K., 14
 U.S., 14, 15, 68, 80n
 vaccine, 209–210
 Filoviridae, 148t
 Final Programmatic Environmental Impact Statement (FEIS), 132, 139
 First Review Conference of BWC, *See* BWC RC1
 Fischer, Georges, 140
 Flaviviridae, 148t, 214
 Fogarty International Center, 147
 Formalin, 211
 Forrestal, James, 63
 Fort Detrick, 120, 230
 ASM Advisory Committee, 193, 231
 field tests, 80n
 investigation of Japanese BWR, 41, 50
 USAMRIID, 180
 vaccine development, 196
 Foundation for Economic Trends, 233–234
 Fourth International Congress on Microbiology, 231
 Fred, Edwin B., 191
 Frisina, Michael, 104
 Frostbite, 26, 30, 32
Future of Biological Disarmament, The (ter Haar), 114, 127n
 FY 1992 Department of Defense Authorization Bill, 235
- G**eneral Accounting Office, 116, 133–134, 198, 204
 Genetic engineering, 150, *See also* Modern biotechnological advances for vaccine development, ix, 213–215
 potential for biological warfare, 117, 133, 152, 153, 234
 Geneva Convention, 13, 23
 Geneva Protocol, 23, 77n, 113, 114, 153
 alleged violation of, 118–119, 128–129
 limitations, 113, 135, 139
 prohibitions, 13, 21, 131
 ratified by Japan, 43n
 ratified by U.S., 13, 236
 U.S. failure to ratify, 14, 60, 61, 63, 71, 74
 "whistle-blower's fund" for, 233–234
 Glanders, 13, 25, 29, 30, 32
 Glenn, John H., 116, 133, 198
 Global Program on AIDS, 170
 Government funding, 105
 Government regulations, 223–224, 228
 Green Cross Company, 37
 Greer, P., 192
 Grmek, M.D., 147, 173n
 Gross, Ernest A., 60
 Group A meningococcal meningitis, 168
- H**aftendorn, Helga, 169–170, 176n
 Hagen, William, 191
 Haig, Alexander, 73, 119
 Halvorson, Harlyn O., 189, 200, 204, 233, 234
 Hansen, Lynn, 193
 Hantaan virus, ix, 148t
 Harbin, 24
 Haskins, Carl, 66
 Haskins Report, 81n
 Hedén, Carl-Göran, 155
 Hemorrhagic fever, 148t, 212, 221–222
 Hill, Edwin V., 41
 Hippocratic Oath, 91
 History of biological warfare, *See* Biological warfare history
 Hobbes, Thomas, 92, 98n
 Hojo Enryo, 36
 Hosts, 148t, *See also* Vectors

- Human experimentation
alleged in Korean War, 56
by Department of Defense, 209
by Japan, 14, 21–43
ethics of, 22
Human growth hormone, 163
Human Immunodeficiency Virus (HIV),
148t, 150, 167
Hungary, 34
Hungate, R.E., 232–233
Huksoll, David, 222

Immunodefenses, 149
Immunosuppression, 150
Inactivated vaccines, 211
Individual welfare, 91, 93, 95–97
Industry control measures, 225–228
Infectious agent characterization, 205–
208
Infectious disease research, 206–208
Infectious clone vaccines, 214–215
Influenza virus, 148t, 150
Intent
of BWC, 135, 153
of possession of offensive agents, 133,
135
of research, xi, xii, 106, 116–117, 181,
184
unclear, 169
International Association of Microbiological
Societies, 8, 232
International Committee of the Red
Cross, 58, 59, 61
International Council of Scientific Un-
ions, 156, 239
International Scientific Commission, 56,
57
International security, 168–170, 225–228
International Union of Microbiological
Societies, 200
Iraq, 43, 104, 153, 227, *See also* Persian
Gulf War
Ishii Shiro, 22–26, 35, 44n
ethics of, 36
field testing by, 28, 33–34
U.S. investigation of, 41, 50
Ishii Unit, 27–29, 33–34, 37

Japanese nationalism, 38–39
Japanese WWII biological warfare re-
search, 16, 21–52, *See also* Hu-
man experimentation
delivery systems, 104
facilities, 24–32
investigation, 41

justification, 36–37, 40
U.S. cover-up, 39, 42, 51, 60, 71, 74
Joliot-Curie, M. Frederic, 231
JRH Biosciences, 219
Junin (Argentine hemorrhagic fever),
148t, 212

Kano Masaji, 35
Kaplan, M., 123, 128n
Kawashima Kiyoshi, 31
King, Jonathan, 101, 106–107
Kitano Masaji, 29, 37, 41, 45n, 50
Koizumi Chikahiko, 22–23
Kunkel, Louis, 191
Kwantung Army Antepizootic Protection
of Horses Unit, 27–28, 33, 37
Kyasanur Forest, 148t

Lassa fever, 148t, 205, 221
Legionella pneumophila (Legionnaire's
disease), 149
Leishmaniasis, 166
Leonard, James, 193
Letter on Toleration (Locke), 92
Leviathan (Hobbes), 92, 98n
LH fermentation, 219
Lie, Trygve, 58, 62
Life-sciences liberalism, 88–99
Live attenuated vaccines, 211, 214
Locke, John, 92–93
Lovett, Robert A., 66, 68
Luria, Salvador, 193
Lwoff, Andre, 232

M-1000 Committee, 192
MacArthur, Douglas, 83
Machupo (Bolivian hemorrhagic fever),
148t, 221–222
Malaria, 166
Malik, Jacob, 59–61, 63, 71
Manchurian experiments, 24–29
Marburg fever, 148t, 205
Masuda Tomasuda, 29, 41
Masuda Yoshiyasu, 38
McNeill, W.H., 147, 173n
Measles, 147, 149
Merck, George W., 192
Merton, Robert, 105
Meselson, Matthew
on openness, xiii, xviin, 194, 198
on BWC RC3, 123, 128n
on "yellow rain," 73, 130, 188
Michigan Department of Public Health,
197

Mill, John Stuart, 86
 Modern biotechnological advances, *See also* Genetic engineering
 attraction for terrorists, 5
 effect on bioweaponry, 88–89, 101–102, 107–108, 117
 peaceful applications, 5–6, 192–193, 208, 215
 Molecular biology, 184, 213
 Mukulsky, M., 123, 128n
 Monkeypox, 148t
 Moss, Bernard, 213
 Mukden (Shenyang), 29
 Murray, E.G., 192
 Mycotoxins, 73, 119, 130

Naito Ryiochi, 37, 40, 41
 Nanking, 29, 33
 National Academy of Sciences, 177, 191, 198
 National Cancer Institute, 177
 National Institute of Allergy and Infectious Diseases (NIAID), 147, 196
 National Institutes of Health (NIH), 147, 189, 190, 196
 Consensus Conference, 221
 peer review, 198
 research programs, 211, 213
 National Security Council (NSC), 70
 National Security Decision Memorandum 35, 178
 National Security Decision Memorandum 44, 178
 Nationalism, 38–39, 96
 Natural hosts, 148t, *See also* Vectors
 Navy Medical Research and Development Command (NMRDC), 147, 165–168
 Naval Medical Research Institute [NMRI], 165
 Naval Medical Research Units (NMRUs), 163, 166–167, 166t
 Ning Bo, 34, 49
 Nixon, Richard
 ban of biological warfare weapons, 15, 178, 193
 speech to U.N. Committee on Disarmament, 140
 Nomonhan incident, 28, 33, 49
 Non Gan county field test, 34
 NSC 5062/1, 69
 NSC 62 (CEBAR), 63–64, 69, 70
 Nuremberg trials, 41, 93, 97
 N.Y.S. Health Laboratories, 213

Office of Naval Research, 198
 On-site inspections, 120, 124, 125, 141, 194
 O'nyong-nyong, 148t
 Openness, xii–xiv, 179, 180, 194
 in research, 193–195, 203–204, 210, 226–228, 232
 in publication, xii, 154, 168, 194, 233
 Oropouche, 148t
 Orthomyxoviridae, 148t
 Osler, William, 93
 Oversight, civilian, xii, 110, 168, 191, 195–199

Pak Hen Yen, 55
 Pan-American Health Organization, 218
 Paoletti, Enzo, 213
 Parkman, Francis, 11, 18n
Pasteurella pestis (plague), 79n
 Peer review, 198, 199, 231
 Peptides, 117
 Persian Gulf War, 1, 104, 171, 191, 235
 Physicians for Human Rights, 239
 Pine Bluff, 67
 Ping Fan, 26–27, 35, 36, 38
 Plague, 25, 29, 30, 32, 34, 167
 Plasmids, 150
 Pledge by scientists, 100–101
 Polio type 3 vaccine, 214
 Polyvalent chimeric RNA virus vaccines, 215
 Porton International Inc., 219, 220 (fig.)
 policy, 222–223
 Poxviridae, 148t
 Prions, 117–118
 Public and Scientific Affairs Board [PSAB], 194, 200, 230, 233–235
 Public Health Service, 196

Rapid diagnosis of infectious agents, 207
 Reagan, Ronald, 73, 132
 Reagan administration, 43, 142
 Recombinant DNA technology, 192, 195,
See also Genetic engineering
 Recombinant vaccinia viruses, 213–214
 Reed, G.R., 192
 Regulatory controls, 209, 223–224, 228
Religio Medici (Browne), 91–92, 98n
 Research and Development Board, 63
 Responsibility, 6, 97, 106, 194, *See also*
 Accountability, Ethical Issues
 Retroviridae, 148t

Review conferences of BWC, *See BWC*
Review Conferences
Ricin-conjugated antibodies, 221
Ridgway, Matthew B., 55, 58
Rifkin, Jeremy, 233-234
Rift Valley fever virus, ix, 148t, 215
Rivers, Thomas, 191
RNA viruses, 148t
Rocio, 148t
Rockefeller University, 147
Roosevelt, Franklin D., 33, 63
Rousseau, Jean-Jacques, 92, 98n

Salk Institute, 120
Salmonella, 168
San Francisco field tests, 80n
Sanders, Murray, 41
Schistosomiasis, 167, 168
Schweitzer, Albert, 93
Scientific societies, 230-238
Scribonius Largus, 91, 97, 98n
Second Review Conference of BWC, *See BWC RC2*
Secrecy, 191, 193, 194
and ethics, 97
and national security, xiv
Department of Defense, 141-142
in Warsaw Pact nations, 155
Japanese WWII biological warfare research, 24-27, 29-30, 35, 38
Senate Governmental Affairs Committee, 116
Seoul virus, 148t
Serratia marcescens, 14
Sherman, Morgan, 191
Shigellosis, 151
Sigma Xi, 239
Simulants, 186
Sindbis virus, 148t, 214, 215
Singapore, 40
SIPRI study, 7-8
Smallpox
and Native Americans, 11-12, 149
vaccine, 212
WHO program, 151, 169, 170
Snyder, Merrill, 232
Social Darwinism, 93, 97
Social welfare, 91, 93, 96-97, 106
Songe Fever [epidemic hemorrhagic fever], 30, 37
Specificity, 88, 107
Stevenson, Earl, 63
Stevenson Committee, 63-66
Stevenson Report, 66, 68
Stimson, Henry L., 177, 191

Sverdlovsk, U.S.S.R., 15, 16, 72, 118, 119, 129, 142, 169, 193
Swedish symposium, 179
Sydenham, Thomas, 92
Sylvester, Arthur, 141
Syphilis, 147

Taliafero, W.H., 191
Tama Unit [Unit Ei-1644], 29-30, 33
Technology transfer, 198
Tenth International Congress of Microbiology, 232
Ter Haar, 114, 116, 123, 124, 127n
Third Review Conference of BWC, *See BWC RC3*
Thompson, Arvo, 41, 50
Threat list, *See DoD "threat list"*
Thymidine kinase (tk) gene, 213
Tick encephalitis, 30, 31, 37
Togaviridae, 148t, 214
Togo Unit, 24-26
Tokyo Army Medical School Department of Immunology, 23
Torticollis, 221
Toxins, 117, 221
control of, 114, 127n, 178, 227
Transparency, *See Openness*
Tricothecene, 119
Truman, Harry S., 14, 63-64, 165
Tsuneishi Kei'ichi, 40, 44n
Tuberculosis, 30, 31, 37
Tularemia, 79n
Two Treatises of Government [Locke], 92
Typhoid fever, 29-31, 33, 34, 151
Typhus, 25, 30, 33, 34

U.K. Department of Health, 219
U.K. Ministry of Defense, 219
U.N., 77n, 118, 140
Committee on Disarmament, 140
Disarmament Commission, 58-60
Unit 100, 27-28, 33, 37
Unit 731, 27-29, 33, 34, 37
Unit Ei-1644 (Tama Unit), 29-30, 33
U.S. Arms Control and Disarmament Agency, 136
U.S. Army Health Services Command, 177
U.S. Army Medical Research and Development Command, 132, 139
U.S. Army Medical Research Institute for Infectious Diseases [USAMRIID], 165, 180, 186, 202-204, 206, 210
USDA, 189

Vaccine development, ix, 125, 196, 210, 213
against biological warfare agents, ix, 102, 106-107, 115-116
Biological Defense Research Program, 133, 186-187
Department of Defense-funded, 202-218
Vaccines, 191, 211, 212, 214, 226 (fig.), 227
Vaccinia virus, ix, 212-214
Validated warfare agents, 235
Vandenberg Hoyt S., 66
Vectors, 57, 83, 148t, 149, *See also* Hosts arthropod, 57, 148t, 206, 208, 214
Vella, E.E., 147, 173n
Venezuelan equine encephalitis, 212, 214, 221
Verification, 194, *See also* BWC verification problems; BWC verification protocol
Vienna Convention on the Law of Treaties, 137

Wakamatsu Unit, 27-28, 33, 37
Wakamatsu Yujiro, 27, 28, 41

Walter Reed Army Institute of Research, 165
War Research Service, 177
Western equine encephalitis virus, 150
"Whistle-blowers' fund," 233-234
Work-of-mercy standard, 97
World Academy of Art and Science, 6
World Health Organization, 170, 217-218
and AIDS, 151
assistance offered, 62
proposed functions, 140, 164-165
World Peace Council, 231

Yellow fever, 148t, 149, 212, 214
"Yellow rain," 72-73, 118-119, 128, 130, 142, 188
Yeltsin, Boris, 72

Zellenstaat theory (cell-state theory), 93, 96
Zhong Ma Camp, 25
Zhong Ma Castle, 25

